SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

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ELECTRICAL

Valid to: February 28, 2019 Certificate Number: 0591.01

In recognition of the successful completion of the A2LA evaluation process (including an assessment of the organization's compliance with A2LA's EPA ENERGY STAR® Accreditation Program[1] requirements), accreditation is granted to this laboratory to perform the following Electrical, EMC, Radio, Product Safety, Telecom, Environmental Simulation, Bluetooth, Fiber Optics and RF Exposure tests:

Test Technology	Test Method(s)[2, 3]
Product Safety Tests	
- Dielectric Strength	CSA C22.2 series of product safety standards including:
- Input Current	No. 9; No. 10; No. 12; No. 13; No. 14; No. 25; No. 30;
- Input Power	No. 36; No. 46; No. 64; No. 66; No. 68; No. 71.1;
- Leakage Current	No. 88; No. 89; No. 94; No. 107.1; No. 107.2; No. 108;
- Force Withstand Test	No. 109; No. 113; No. 114; No. 117; No. 118; No. 120;
- Impact Ball Test	No. 122; No. 125; No. 128; No. 142; No. 150; No. 151;
- Ground Impedance	No. 157; No. 166; No. 173; No. 174; No. 191; No. 195;
- Strain Relief Test	No. 205; No. 213; No. 221; No. 223; No. 224; No. 231;
- Heat Rise - Thermocouple Method	No. 236; No. 280; No. 301; No. 601.1; No. 745-1;
- Tilt Test	No. 60601-1 (*Excluding Risk Assessment*);
- Temperature Conditioning	No. 60601-2-2; No. 60601-2-7; No. 60601-2-18;
- Humidity Conditioning	No. 60601-2-22; No. 60601-2-34; No. 60601-2-37;
- Flammability (UL 94V0)	No. 60601-2-38; No. 60601-2-40; No. 60601-2-46;
- Ball Pressure Test	No. 60601-2-49; No. 60601-2-51; No. 60601-2-54;
- Impact Hammer Test	No. 60745-2-1; No. 60745-2-2 (*Excluding Hammer Test*);
- Icing	No. 60745-2-3 to -6; No. 60745-2-8; No. 60745-2-9;
- Rain/Hose Down Test	No. 60745-2-11; No. 60745-2-12; No. 60745-2-14;
- Heat Rise - Rise of Resistance Method	No. 60745-2-17; No. 745-2-30; No. 745-2-31;
- Impulse Test of UL/CSA 60950-1	No. 745-2-32; No. 745-2-33; No. 745-2-34;
- Mold Stress	No. 745-2-35; No. 745-2-36; No. 745-2-37;
- Abnormal Operation (component failure)	No. 60065; No. 60947-1; No. 60947-4-1; No. 60950-1; No. 61010-1; No. 61010-2-10; No. 61010-2-32; No. 61010-2-42; No. 61010-2-43; No. 61010-2-45; No. 61010-2-51; No. 61010-2-61; No. 61010-2-81; No. 61010-2-101;

Test Technology	Test Method(s)[2, 3]
Product Safety Tests (cont'd)	CSA C22.2 (cont'd): No. E60335-1; No. E60335-1/4E; No. E60335-2-3; No. E60335-2-6; No. E60335-2-7; No. E60335-2-11; No. E60335-2-16; No. E60335-2-21; No. E60335-2-23; No. E60335-2-25 to -30; No. E60335-2-32; No. E60335-2-34 to -43; No. E60335-2-45; No. E60335-2-47 to -52; No. E60335-2-54; No. E60335-2-56; No. E60335-2-58; No. E60335-2-62; No. E60335-2-64; No. E60335-2-67; No. E60335-2-68; No. E60335-2-69; No. E60335-2-76; No. E60335-2-82; IEC/EN/CAN/CSA E60079-0, 1, 2, 5, 6, 7, 11, 14, 15, 18, 26, 28, and 31; EN/ISO 80079-36 and 37; EN 60204-1; EN 60215; IEC 60745-1 and all part 2's; EN 60601-1 and all part 2's (*Excluding clauses 29 and 59*); AS/NZS/EN 60950-1 (*Excluding clauses detailed in Table #1 below*[4]); IEC 60950-22; EN 60065 (*Excluding clauses detailed in Table #2 below*[4]); EN 61010-1 and all part 2's (*Excluding clauses detailed in Table #3 below,*[4] *and EN 61010-2-51, Clause 5.4.4.101 Steam Cleaning*); EN 60335-1 (*Excluding clauses detailed in Table #4 below*[4]); IEC/EN/UL 60335-2 (*Excluding clauses detailed in Table #5 below*[4]); UL 2735; UL 2735C; IEC/EN/EN/CSA/UL 60079-18, 26, 28, 31; ULC 60839-11-1; EN/ISO 80079-36, 37; 16 CFR 1505
Energy Efficiency	
Energy Efficiency for Telecommunications Equipment: Methodology for Measurement and Reporting – Server Requirements	ATIS-0600015.01.2014
Energy Efficiency for Telecommunications Equipment: Methodology for Measurement and Reporting – Transport Requirements	ATIS-0600015.02.2016
Energy Efficiency for Telecommunications Equipment: Methodology for Measurement and Reporting – Router and Ethernet Switch Products	ATIS-0600015.03.2013
Test Procedure for the Measurement of Energy Consumption of Set-Top Boxes (STBs)	CET-2043; CSA C380-08
Test Method for Calculating the Energy Efficiency of Single-Voltage External AC-DC and AC-AC Power Supplies	CSA C381.1-08

Test Technology	Test Method(s)[2, 3]
Battery Charging Systems	IEC Standard 61951-1: Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes – Portable Sealed Rechargeable Single Cells – Part 1: Nickel-cadmium, Ed. 2.1, January 2006; IEC Standard 61951-2 Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes – Portable Sealed Rechargeable Single Cells – Part 2: Nickel-metal hydride, Ed. 2.0, April 2003; IEC Standard 61960: Secondary Cells and Batteries Containing Alkaline or Other Non-acid Electrolytes – Secondary Lithium Cells and Batteries for Portable Applications, Ed. 1.0, December 2003
Airport Lighting	FAA Specification for L-823 Plug and Receptacle, Cable Connectors AC No: 150/5345-26D; FAA Specification for Wind Cone Assemblies – AC No: 150/5345-27E (*excluding photometrics*); FAA Specification for Obstruction Lighting Equipment – AC No: 150/5345-43G (*excluding photometrics*); FAA Specification for Runway and Taxiway Light Fixtures – AC No: 150/5345-46E (*excluding photometrics*); FAA Specification for Series to Series Isolation Transformers for Airport Lighting Systems – AC No: 150/5345-47C
ENERGY STAR Testing Product Family Guideline (*Using IEC 62301 Household electrical appliances – Measurement of standby power*)	
Refrigerated Beverage Vending Machines (Indoor/ Outdoor / Protected locations)	ENERGY STAR Program Requirements Product Specification for Refrigerated Beverage Vending Machines, Version 3.1; ASHRAE Standard 32.1-2004, Methods of Testing for Rating Vending Machines for Bottled, Canned, and Other Sealed Beverages; 10 CFR Part 431 Subpart Q; 10 CFR Part 431.294
Televisions	ENERGY STAR Program Requirements for Televisions, Version 6.1; IEC 62087, Ed 2.0 and Ed 3.0: Methods of Measurement for the Power Consumption of Audio, Video and Related Equipment; CEA-2037: Determination of Television Average; CEA: Procedure for DAM Testing; ENERGY STAR Test Method for Televisions, Rev. Aug-2010; Final Rule Test Procedures for Television Sets incorporated in Appendix H to Subpart B of 10 CFR § 430 and 10 CFR § 429.25

Test Technology	Test Method(s)[2, 3]
ENERGY STAR Testing (cont'd)	
Computers *Computer Types Tested:* *Desktops & Notebooks;* *Workstations;* *Game Consoles;* *Small-Scale Servers; Thin Clients*	ENERGY STAR Program Requirements Product Specification for Computers, Version 6.1; EPRI Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies (for Products that have Internal, Multi-output, or Single Output with Integral Cooling Power Supplies); ENERGY STAR Test Method for Computers, Rev. August-2014
Telephony	ENERGY STAR Program Requirements for Telephony, Version 3.0; ENERGY STAR Test Method for Telephony Rev. November-2013
Computer Servers	ENERGY STAR Test Procedure for Determining the Power Use of Computer Servers at Idle and Full Load (Appendix A of Specification); ENERGY STAR Test Method for Computer Servers, Rev. April 2016; Generalized Internal Power Supply Efficiency Test Protocol, Rev. 6.6 (available at www.efficientpowersupplies.org); Standard Performance Evaluation Corporation (SPEC) most current Server Efficiency Rating Tool (SERT), Version 1.1.1
Data Center Storage	ENERGY STAR Program Requirements for Data Center Storage, Version 1.0; Test Method for Data Center Storage Equipment, Rev. August 2013; Product Specification for Data Center Storage Equipment, Rev. August 2013; SNIA Emerald Power Efficiency Measurement Specification v2.0.2
Large Network Equipment	ENERGY STAR Product Specification for Large Network Equipment (Version 1.0); ENERGY STAR Test Method for Large Network Equipment (December 2015)
Displays	ENERGY STAR Program Requirements Product Specification for Displays, Version 7.1; ENERGY STAR Test Method for Determining Displays Energy Use Version 6.0 – Rev. September 2015; IEC 62087, Ed 2.0, Ed 3.0: Methods of Measurement for the Power Consumption of Audio, Video and Related Equipment, CEA-2037: Determination of Television Average Power Consumption

Test Technology	Test Method(s)[2, 3]
ENERGY STAR Testing (cont'd)	
Imaging Equipment	ENERGY STAR Program Requirements, Product Specification for Imaging Equipment, Version 2.0; ENERGY STAR Imaging Equipment Test Method, Rev. Sep-2014; EPRI Generalized Test Protocol for Calculating the Energy Efficiency of Internal Ac-Dc and Dc-Dc Power Supplies at: ww.efficientpowersupplies.org; External Power Supply (Single- and Multiple-voltage EPSs): Uniform Test Method for Measuring the Energy Consumption of External Power Supplies, Appendix Z to 10 CFR Part 430
Uninterruptible Power Suppliers (UPSs)	ENERGY STAR Program Requirements for Uninterruptible Power Supplies, Version 1.1; ENERGY STAR Test Method for Uninterruptible Power Supplies, Rev. May 2012; IEC 62040-3:2011 Ed. 2; ATIS 060015:2009; ATIS 0600015.04:2010; Optional Test Method (UPSs Capable of Operating at 115 V and 60 Hz that use NEMA 1-15P or 5-15P Plug): Uniform Test Method for Measuring the Energy Consumption of Battery Chargers Incorporated in Appendix Y to Subpart B of 10 CFR 430, Section 4: Testing Requirements for Uninterruptible Power Supplies (DOE test Method)
Set-top Boxes	ENERGY STAR Product Specification for Set-top Boxes, Version 5.0; ENERGY STAR Test Method for Set-top Boxes (CET-2043), Set-top Box (STB) Power Measurement, Rev, August-2013, Subject to the Clarifications in Sections 4.2–4.9
Telecommunications	
AC Impedance	ANSI C12.1;
AC Power Fault Tests	ANSI C12.20;
Acoustic Coupling	AS/ACIF S002;
Alarm Indications Signal	AS/ACIF S003;
Analog	AS/ACIF S004;
Automatic Dialing and Redialing	AS/ACIF S006;
Bandpass	AS/ACIF S016;
Battery Noise	ATIS 0600315;
Billing Protection	ATT-TP-76200 (DC Power);
Bit Rates	ETSI TBR3 (*Only Layer 2 & 3*);
Bonding and Grounding	ETSI TBR4;
Clock Accuracy	ETSI TBR12;
Corrosion	ETSI TBR13;
Current Drains	FCC 47 CFR Part 68;
Current Limiting Protector Tests	GR-1089-CORE;
DC Potential Difference	GR-295-CORE;

Test Technology	Test Method(s)[2, 3]
Telecommunications (cont'd)	
DC Resistance	IC CS-03, Part I, Issue 9, Amendment 4, 2010;
Distribution Voltage Drops	IC CS-03, Part II, Issue 9, Amendment 1, 2012;
DTMF Signaling	IC CS-03, Part V, Issue 9, Amendment 1, 2009;
Effect of Internal Heating	IC CS-03, Part VI, Issue 9, Amendment 1, 2012;
Effect of Operating Temperature	IC CS-03, Part VII, Issue 9, Amendment 4, 2012;
Effect of Polyphase Loading	IC CS-03, Part VIII, Issue 9, Amendment 4, 2009;
Effect of Relative Humidity	ITU-T G.703;
Effect of Storage Temperature	ITU-T G.823;
Specifications for Approval of Type of	LMB-EG-07;
Electricity Meters, Instrument	TIA TSB-31;
Transformers and Auxiliary Devices	TIA-168-B;
Effect of Temporary Overloads	Verizon TPR 9103;
Electrical Fast Transients	Verizon TPR 9203;
Electrical Safety (GR-1089-CORE)	Verizon TPR 9204;
Encoded Analog Content	Verizon TPR 9205;
Equality of Current Circuits	Verizon TPR 9301;
Extraneous AC Energy	Verizon TPR 9302;
Frame Structure	Verizon TPR 9305;
Frequency Response	Verizon TPR 9502;
Hazardous Voltage	Verizon TPR 9503;
Hearing Aid Compatibility-Magnetic	Verizon TPR 9504;
High Output Voltage Shutdown	Verizon TPR 9505;
Immunity	Verizon TPR 9801
Independence of Elements	
Insulation Resistance	
Intrinsic Jitter	
Intrusion Tones	
ISDN	
Jitter Tolerance	
Labeling Requirements	
Leakage Current	
Lightning Surge	
Limitations on Automatic Redialing	
Line Connection	
Line Rate	
Listing Requirements	
Load Performance	
Longitudinal Steady State Voltage Stress	
Low Input Voltage Recovery	
Low Input Voltage Shutdown	
Mechanical Characteristics	
Mechanical Shock	
Mechanical Vibration	
Meter Losses	
Minimum Operating Voltage	
Noise Immunity No Load	

Test Technology	Test Method(s)[2, 3]
Telecommunications (cont'd)	
Output Frame Structure	
Output Jitter	
Output Port Signal Coding	
Output Power	
Output Structure	
Output Timing	
Over and Under Voltage Transients	
Physical Characteristics	
Pulse Repetition	
Pulse Template	
Pulse Shape	
Rain Tightness	
Return Loss	
Return to Service	
Ringer Equivalence Number	
Ring-in/Loop-out Exchange lines	
Sensitivity	
Short Circuit Tests	
Signal Power	
Signaling Requirements	
Stability of Performance	
Starting Load	
Steady State Input DC Voltage	
Steady State Power Induction	
Supervisory Tones	
Switch block/Transmission Path Performance	
Temperature Rise	
Timing Functions	
Transient Tests	
Transmitted Digital Signal Power	
Transmitted Voltages	
Transmitter Spectral Response	
Transportation Drop	
Transportation Vibration	
Transverse Balance	
Variation of Ambient Temperature	
Variation of Frequency	
Variation of Power Factor	
Variation of Voltage	
Waveform Shape	
Weather Simulation	
xDSL	

Test Technology	**Test Method(s)[2, 3]**
Electrical / Fiber (ESL)	
Current Carrying Capacity Test	FOTP-181
Electrical Requirements	ANSI/NFPA 70; GR-487; GR-950; GR-1209; GR-1221; GR-1435
Point Discontinuities	FOTP-59; FOTP-61
Capacitance	MIL-STD-202 F & G, Method 305
Contact Resistance	MIL-STD-202 F & G, Method 307
Current/Voltage/Watts (up to 225 amps and 600 volts)	ANSI C.12.1, C.12.20; LMB-EG-07
Dielectric Constant	ASTM D250
Dielectric Strength (Withstand)	MIL-STD-202 F & G, Method 301; ASTM D149
Inductance and Impedance	MIL-STD-883 E & F, Method 309
Insulation Resistance	MIL-STD-202 F & G, Method 302; MIL-STD-883 E & F, Method 1003
Contact Bounce	MIL-STD-202 F & G, Method 310 (Measured with Oscilloscope)
Electromagnetic Compatibility	
Emissions	
Radiated and Conducted Emissions *(3 m semi-anechoic chamber, 10 m OATS with weather protection)*	CISPR 32; EN 55032; CISPR 22; EN 55022; AS/NZS CISPR 22; KN 22; CISPR 11; EN 55011; AS/NZS CISPR 11; KN 11; ANSI C63.4:2014; FCC-MP-5:1986; ICES-001; ICES-003; CNS 13438 (*up to 6 GHz*); VCCI V-3 (*up to 6 GHz*); VCCI-CISPR 32; TCVN 7189:2009
Harmonics and Flicker	EN 61000-3-2; EN 61000-3-3
Immunity	
Electrostatic Discharge	IEC/EN/KN 61000-4-2; ISO 10605 (*excluding section 10 vehicle test method*)
Radiated Immunity	IEC/EN/KN 61000-4-3
EFT/B	IEC/EN/KN 61000-4-4
Surge	IEC/EN/KN 61000-4-5; IEEE C62.41-1; IEEE C62.41-2; IEEE C62.45

Test Technology	Test Method(s)[2, 3]
Electromagnetic Compatibility (cont'd)	
Immunity (*cont'd*)	
Conducted Immunity	IEC/EN/KN 61000-4-6
Magnetic Immunity	IEC/EN/KN 61000-4-8
Pulse Magnetic Field	IEC/EN 61000-4-9
Damped Oscillatory Magnetic Field	IEC/EN 61000-4-10
Voltage Dips and Interrupts	IEC/EN/KN 61000-4-11
Oscillatory Waves Immunity	IEC/EN 61000-4-12
Damped Oscillatory Wave Immunity	IEC/EN 61000-4-18
Voltage Dips, Short Interruptions and Variations on D.C. Input Power Port	IEC/EN 61000-4-29
Family, Product or Industry Specific Specifications	ANSI C12.1; ANSI C12.20; KN 14-1; KN 14-2; KN 24; CISPR 24; IEEE C37.90; IEEE C37.90.1; IEEE C37.90.2; IEEE C37.90.3; IEEE-299 1997 and 2006; IEEE C57.13 (*CT Testing only*); IEC C57.13.6 (*CT Testing only*); IEEE 1613; ASTM D4935:2010; EN 12184; ETSI EN 300 132-2; IEC/EN 50065-1, IEC/EN 50065-2-1; IEC/EN 50065-2-3; IEC/EN 50121-1; IEC/EN 50121-3-2; IEC/EN 50121-4; IEC/EN 50121-5; IEC/EN 50130-4; IEC/EN 50270; EN 50370-1; EN 50370-2; EN 50470-1, EN 50470-3; EN 55014-1 (*excluding measurement of clicks*); EN 55014-2; EN 55103-1; EN 55103-2; EN 55024; IEC 60044-1 (*CT Testing only*); IEC/EN 60255-26; IEC/EN/KN 60601-1-2; IEC/EN 60601-2-2 through -2-13; IEC/EN 60601-2-16 through -2-30; IEC/EN 60601-2-32 through -2-42; IEC/EN 60601-2-44; IEC/EN 60601-2-45; IEC/EN 60601-2-46; IEC/EN 60601-2-47; IEC/EN 60601-2-49; IEC/EN 60601-2-50; IEC/EN 60601-2-51; IEC/EN 60601-2-52; IEC/EN 60601-2-54; EN/KN 60945; EN/KN 61000-6-1; EN/KN 61000-6-2; EN/KN 61000-6-3; EN/KN 61000-6-4; IEC/EN 61326-1; IEC/EN 61326-2-1; IEC/EN 61326-2-2; IEC/EN 61326-2-3; IEC/EN 61326-2-4; IEC/EN 61326-2-5; IEC/EN/KN 61547; IEC/EN 61850-3; IEC 61869-2 (*CT Testing only*); IEC/EN 62052-11; IEC/EN 62053-11; IEC/EN 62053-21; IEC/EN 62053-22; IEC/EN 62053-23; UL/CSA/IEC/EN 62368-1;

Test Technology	Test Method(s)[2, 3]
Electromagnetic Compatibility (cont'd)	
Family, Product or Industry Specific Specifications (*cont'd*)	Telcordia GR-1089; ETSI EN 300 386; ISO 7176-21 (Wheelchair EMC); RTCA/DO-160A through G (*only Sections 15 to 19,* 22 *and 25*); MIL-STD-461A through C using MIL-STD-462 (*excluding transient test RS105 in B and C*); MIL-STD-461D using MIL-STD 462D (*excluding transient test RS105*); MIL-STD-461E (*excluding transient test RS105*); MIL-STD-461F (*excluding reverberating chamber test method RS-103 and transient test RS105*); MIL-STD-461G (*excluding reverberating chamber test method RS-103 and transient test RS105*); MIL-STD-704A-F with MIL-HDBK-704-1 through 8; MIL-STD-1275A through E; DOD-STD-1399, Sections 070 Part 1 1979; MIL-STD-1399, Sections 300A and 300B; MIL-PRF-28800F
Automotive EMC	CISPR 25; ISO 7637-2; ISO 11452-2; ISO 11452-4; ISO 13766; ISO 14982; SAE J1455
Intentional and Unintentional Radiators using ANSI C63.4:2014 and ANSI/TIA 603-D (*Unless otherwise noted*); (*Excluding SAR and HAC*)	47 CFR, FCC Parts 2, 11 and 15 (*Using ANSI C63.4:2014, ANSI C63.10:2013, ANSI C63.17:2013, and FCC KDB 905462 D02 (v02)*); 47 CFR, FCC Part 18 (*using MP-5:1986*); 47 CFR, FCC Parts 20 (Signal Boosters: *using FCC KDB 935210 D03 (v04), FCC KDB 935210 D04 (v02), and FCC KDB 935210 D05 (v01r01)*), 22, 24, 25, 27, 74, 80, 87, 90, 95, 96, 97 and 101 (*using ANSI/TIA 603-D*); AZ/NZS 4268; AZ/NZS 4295; AZ/NZS 4281; AZ/NZS 4355; AZ/NZS 4365; AZ/NZS 4768; AZ/NZS 4770; AZ/NZS 4771; ARIB STD-T96; ETSI EN 300 086-1; ETSI EN 300 113-1; ETSI EN 300 113-2; ETSI EN 300 127; ETSI EN 300 132-1; ETSI EN 300 220-1; ETSI EN 300 220-2; ETSI EN 300 220-3; ETSI EN 300 328; ETSI EN 300 330-1; ETSI EN 300 330-2; ETSI EN 300 342-1; ETSI EN 300 342-2; ETSI EN 300 342-3; ETSI EN 300 385; ETSI EN 300 390-1; ETSI EN 300 390-2; ETSI EN 300 440-1; ETSI EN 300 440-2; ETSI EN 300 487; ETSI EN 300 609-4; ETSI EN 300 683; ETSI EN 300 198; ETSI EN 300 786; ETSI EN 301 441; ETSI EN 301 489 series 1-34; ETSI EN 301 502; ETSI EN 301 893; ETSI EN 302 217; ETSI EN 302 502; ETSI EN 302 208-1; ETSI EN 302 208-2;

Test Technology	Test Method(s)[2, 3]
Electromagnetic Compatibility (cont'd)	
Intentional and Unintentional Radiators (*cont'd*)	HKCA 1001; HKCA 1002; HKCA 1003; HKCA 1004; HKCA 1005; HKCA 1006; HKCA 1007; HKCA 1008; HKCA 1010; HKCA 1015; HKCA 1016; HKCA 1019; HKCA 1020; HKCA 1022; HKCA 1026; HKCA 1027; HKCA 1030; HKCA 1034; HKCA 1035; HKCA 1036; HKCA 1037; HKCA 1039; HKCA 1041; HKCA 1042; HKCA 1043; HKCA 1044; HKCA 1045; HKCA 1046; HKCA 1047; HKCA 1048; HKCA 1049; HKCA 1050; HKCA 1052; HKCA 1053; HKCA 1054; HKCA 1056; HKCA 1061; HKCA 1063; IMDA TS SRD; IMDA TS LMR; IMDA TS AR; IMDA TS CT-CTS; IMDA TS WBA; IMDA TS RPG; IMDA TS UWB; IS2034-1; IS2045-0; LP0002; PLMN09; RSS-102; RSS-111; RSS-112; RSS-117; RSS-118; RSS-119; RSS-123; RSS-125; RSS-127; RSS-129; RSS-130; RSS-131; RSS-132; RSS-133; RSS-134; RSS-135; RSS-137; RSS-138; RSS-139; RSS-141; RSS-142; RSS-170; RSS-181; RSS-182; RSS-191; RSS-192; RSS-194; RSS-195; RSS-196; RSS-197; RSS-199; RSS-210; RSS-213; RSS-215; RSS-220; RSS-236; RSS-238; RSS-243; RSS-244; RSS-247; RSS-287; RSS-288; RSS-310; RSS-GEN
Battery Testing	
Short-Circuit/External/Internal/Abnormal Charging (high charging rate)	CTIA Certification Requirements for Battery System Compliance to IEEE 1625; GR 3150; GR 3168; IEC 62133; IEEE 1625; UL 1642; UL 2054; UN/DOT 38.3
Continuous Low-Rate Charge	IEC 62133
Incorrect Installation of a Single Cell	IEC 62133
Forced Discharge	IEC 62133; UL 1642; UL 2054; UN/DOT 38.3
Abusive Overcharge	UL 2054
Overcharge	IEC 62133; UN/DOT 38.3
External Reverse Polarity	GR 3150; GR 3168
Overdischarge	GR 3150; GR 3168
EMC	GR 3150; GR 3168
Cell Orientation	CTIA Certification Requirements for Battery System Compliance to IEEE 1625; IEEE 1625

Test Technology	Test Method(s)[2, 3]
Battery Testing (cont'd)	
Cell Monitoring	CTIA Certification Requirements for Battery System Compliance to IEEE 1625; IEEE 1625
Evaluation of Excess Lithium Plating and Short-Circuit Test on Cycled Cells	CTIA Certification Requirements for Battery System Compliance to IEEE 1725; IEEE 1725
Cell/Pack Overcurrent Protection Device	CTIA Certification Requirements for Battery System Compliance to IEEE 1725 & IEEE 1625; IEEE 1625; IEEE 1725;
Limit Output Current (External Short-Circuit Considerations)	CTIA Certification Requirements for Battery System Compliance to IEEE 1725; IEEE 1725
ESD	CTIA Certification Requirements for Battery System Compliance to IEEE 1725 & IEEE 1625; IEEE 1625; IEEE 1725
Battery Management Circuit Design	CTIA Certification Requirements for Battery System Compliance to IEEE 1725 & IEEE 1625; IEEE 1625; IEEE 1725
Current Limiting	CTIA Certification Requirements for Battery System Compliance to IEEE 1725 & IEEE 1625; IEEE 1625; IEEE 1725

Note: For Product Safety tests, this laboratory meets A2LA *R104 – General Requirements: Accreditation of Field Testing and Field Calibration Laboratories* excluding Acoustic Pressure, Overvoltage/Line Cross, Surge/Impulse, and Flammability.

[1] A2LA provides accreditation to the U.S. EPA's *Conditions and Criteria for Recognition of Laboratories for the ENERGY STAR Program* by verifying an organization's compliance to A2LA document *R222 - Specific Requirements - EPA ENERGY STAR Accreditation Program* and to the related test methods listed above.

Accreditation by A2LA does not infer Recognition by the EPA for ENERGY STAR testing. Please verify this organization's recognition status by using the EPA's searchable database, located at http://www.energystar.gov/index.cfm?fuseaction=recognized_bodies_list.show_RCB_search_form

[2] When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is expected to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA *R101 - General Requirements- Accreditation of ISO-IEC 17025 Laboratories*.

[3] This laboratory is only accredited for testing activities outlined within the test methods listed above. Reference to any other activity within these standards, such as risk management or risk assessment, does not fall within the laboratory's accredited capabilities.

On the following products or types of products: Information Technology Equipment, Household Appliances, Industrial Equipment, Audio/Visual Equipment, Wireless Equipment, Medical Electrical Equipment, Radio Equipment, Electric Tools, Lighting Equipment, Telecommunications Equipment, Power Supplies, Batteries

[4]Exclusion Tables

Table #1: Clauses excluded from AS/NZS and EN 60950-1

Standard	Clause	Test
60950-1		
	2.10.4	Comparative Tracking Index measurements
	2.10.5.4	Partial Discharge Test (on semiconductors)
	2.10.8.4	Abrasion resistance test
	3.2.5.1	Flexing test of AC power supply cords
	4.2.8	CRT tests
	4.3.12	Flammable liquid measurement
	4.3.13.2	Ionizing Radiation
	4.3.13.3	Tests after UV exposure on material
	4.3.13.4	Human exposure to UV radiation
	4.3.13.5	Laser radiation
	4.6.2	Hot flaming oil
	Annex AA	Mandrel test

Table #2: Clauses excluded from EN 60065-1

Standard	Clause	Test
60065-1		
	6.1	Ionizing radiation
	6.2	Laser radiation
	7	Vicat softening
	8.18	Endurance test for wound components
	12.3	Barrel test for remote controls
	13.4	Comparative tracking index measurement
	14.1	Surge on resistors
	14.2	RC Circuit tests
	16	Cord flexing
	18	CRT tests
	Annex H	Insulated winding wire

Table #3: Clauses excluded from EN 61010-1

Standard	Clause	Test
61010-1		
	6.7.1.2	CTI measurement
	10.5.3	Vicat softening
	12.2.1	Ionizing radiation
	12.5.2	Ultrasonic pressure
	12.6	Laser radiation
	13.3	High vacuum devices (CRT)

[4]**Exclusion Tables (cont'd)**

Table #4: Clauses excluded from EN 60335-1

Standard	Clause	Test
60335-1		
	19	IEC 61000-4-13 Mains Signal Test
	22	Oxygen Bomb (for rubber ageing) Methylated spirit and pressure (for testing ceramic insulation)
	24	Some Component testing. (SAF typically requires Safety critical components to have appropriate certification)
	Annex F	Capacitor testing
	Annex H	Endurance testing (special apparatus)
	Annex J	Coated PCB test
	Annex R	Software validation

Table #5: Clauses excluded from IEC/EN 60335-2

Standard	Clause	Test
60335-2-7	15	Aging for elastomeric parts
60335-2-34	6	Running overload test (for motors)
60335-2-36	30	Glow-wire test
60335-2-37	30	Glow-wire test
60335-2-38	30	Glow-wire test
60335-2-39	30	Glow-wire test
60335-2-40	22	Vacuum pressure
60335-2-42	30	Glow-wire test
60335-2-48	30	Glow-wire test
60335-2-54	21	Mechanical tests for current carrying hoses
60035-2-58	15/ Annex BB	Ageing for elastomeric parts
	Annex CC	Back siphonage
60335-2-69	21	Mechanical tests for current carrying hoses

Testing Activities Performed in Support of FCC Declaration of Conformity and Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[5]:

Rule Subpart/Technology	**Test Method**	**Maximum Frequency**
Unintentional Radiators		
Part 15B	ANSI C63.4:2014	40 GHz
Industrial, Scientific, and Medical Equipment		
Part 18	FCC MP-5 (February 1986)	6 GHz
Intentional Radiators		
Part 15C	ANSI C63.10:2013	40 GHz
Unlicensed Personal Communication Systems Devices		
Part 15D	ANSI C63.17:2013	40 GHz

Testing Activities Performed in Support of FCC Declaration of Conformity and Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[5]:		
Rule Subpart/Technology	**Test Method**	**Maximum Frequency**
U-NIII without DFS Intentional Radiators		
Part 15E	ANSI C63.10:2013	40 GHz
U-NIII with DFS Intentional Radiators		
Part 15E	FCC KDB 905462 D02 (v01)	40 GHz
UWB Intentional Radiators		
Part 15F	ANSI C63.10:2013	40 GHz
BPL Intentional Radiators		
Part 15G	ANSI C63.10:2013	40 GHz
White Space Device Intentional Radiators		
Part 15H	ANSI C63.10:2013	40 GHz
Commercial Mobile Services (FCC Licensed Radio Service Equipment)		
Parts 22 (cellular), 24, 25 (non-microwave), and 27	ANSI/TIA-603-D; TIA-102.CAAA-D	40 GHz
General Mobile Radio Services (FCC Licensed Radio Service Equipment)		
Parts 22 (non-cellular), 90 (non-microwave), 95, 97, and 101 (non-microwave)	ANSI/TIA-603-D; TIA-102.CAAA-D	40 GHz
Citizens Broadband Radio Services (FCC Licensed Radio Service Equipment)		
Part 96	ANSI/TIA-603-D; TIA-102.CAAA-D	40 GHz
Maritime and Aviation Radio Services		
Parts 80 and 87	ANSI/TIA-603-D	40 GHz
Microwave and Millimeter Bands Radio Services		
Parts 25, 74, 90 (90Y, 90Z, DSRC), and 101	ANSI/TIA-603-D; TIA-102.CAAA-D	40 GHz
Signal Boosters		
Part 20 (Wideband Consumer Signal Boosters, Provider-specific signal boosters, and Industrial Signal Boosters)	FCC KDB 935210 D03 (v04); FCC KDB 935210 D04 (v02); FCC KDB 935210 D05 (v01r01)	40 GHz

[5]Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (https://apps.fcc.gov/oetcf/eas/) for a listing of FCC approved laboratories.

Accredited Laboratory

A2LA has accredited

MET LABORATORIES, INC.

Baltimore, MD

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This laboratory also meets the requirements of *R222 - Specific Requirements - EPA ENERGY STAR Accreditation Program* in the Electrical field. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 5th day of June 2017.

President and CEO
For the Accreditation Council
Certificate Number 0591.01
Valid to February 28, 2019
Revised January 29, 2019

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.